



Colorado

Department of Personnel  
& Administration

## Colorado State Capitol Geothermal Project Fact Sheet

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### **The Capitol Geothermal Project History**

The capitol geothermal project is the final phase of DPA/Capitol Complex energy performance contract started in 2003. The entire project will result in a total of \$29 million in energy conservation measures when completed. The performance contract guarantees \$1.1 million in annual utility savings through reduced electrical use (30%), reduced steam use (50%) and reduced water consumption (15%). Projects have included a variety of conservation measures - from changing light bulbs to installing new low-flow toilets, DDC controls, boiler and chiller replacement. The Colorado State Capitol is the first state capitol in the country to be cooled with a geothermal system (the Idaho State Capitol is heated from an active geothermal hot spring).

### **The Geothermal Well System**

The project uses an open loop 2 well system. Two wells were drilled to a depth of 850 feet to the Arapahoe Aquifer. The wells are located on the NE and SE inner circle quadrants of the capitol. Constant 65 degree water is pumped up from one well, channeled through a heat exchanger, and then returned to the aquifer through the second well. The system is designed so water can be pumped from well A to well B, or from well B to well A. The pumping system is 100% redundant. Maximum pumping volume from each well will be 300 – 350 GPM at peak load periods. The expected life of the well system is 100+ years; the expected life of the well pumps is 20 years.

### **The Geothermal Heat Pump System**

The project will replace HVAC system equipment that is anywhere from 25 to 70 years old throughout the capitol without affecting existing ductwork; no ducts will be added or replaced. Cooling will be added to both the Senate and House Chambers through existing duct systems. The Capitol Geothermal System also reduces our main chiller loop load by approximately 200 tons per year. The heating/cooling upgrades include:

- Demolition and replacement of 28 air handlers in the State Capitol
- Install updated controls
- Removal of HVAC steam systems
- Adding air conditioning to the House and Senate Chambers

### **Project Finance**

The total geothermal project cost stands at approximately \$6.6 million. This amount is paid through two principle means:

- Department of Energy "Demonstration Project" Program Grant \$4,600,000, and
- DPA 15-year lease/purchase of \$1,440,000 paid through *guaranteed* utility savings

The entire project is scheduled to be completed by the end of summer 2013.